Water Efficient Maize for Africa Project

WEMA Water Efficient Maize for Africa

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Background

Africa is a drought-prone continent, making farming risky for millions of smallholder farmers who rely on rainfall to water their crops. Maize is the most widely grown staple crop in Africa – more than 300 million people in Africa depend on it as their main food source – but too often it is severely affected by frequent drought. Drought leads to crop failure, hunger, and poverty. Climate change will only worsen the problem.

Like drought, insects present a challenge for smallholder maize farmers in Africa, who have little or no resources to effectively manage them. During drought, maize that is able to survive becomes particularly susceptible to pests. These insects negatively impact yields, because they reduce maize plant's ability to use the limited water and nutrients. In some cases, farmers effectively lose the whole crop.

> ***Predictions are that climate change will make the farming situation worse in South Africa, with shorter seasons, more rainfall variability and higher temperatures expected in the region. Therefore, drought-tolerant varieties are urgently required to stabilise the household food production and, in the long term, the income of smallholder families.***
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> *Kingstone Mashingaidze, WEMA-South Africa Country Coordinator and Programme Manager for Plant Breeding and Biotechnology, ARC South Africa*

300 million...*number of people who depend on maize as a main food source in Africa*

Protecting maize against drought and insect damage

Maize is the most widely grown food crop in Africa and its production is severely affected by drought and insect-pests, which negatively impact yields leading to crop failure, hunger and poverty

Identifying ways of mitigating drought risk, insect-pest pressure, stabilising yields, and encouraging smallholder farmers to adopt best management practices, is fundamental to realising food security and improving livelihoods in the continent. Drought tolerance has been recognised by the United Nation's Food and Agriculture Organization as one of the most important targets of crop improvement programmes, and biotechnology has been identified as a powerful tool to achieve significant drought tolerance.

The Water Efficient Maize for Africa (WEMA) is a public private partnership that is developing drought-tolerant and insect-pest protected maize hybrids, with the aim of improving yields under moderate drought stress and protecting it from insect damage. The long-term goal is to deploy these new varieties and make them available to smallholder farmers royalty-free through local African seed companies.

Project goal

The WEMA partnership was formed in response to a growing call by African farmers, leaders, and scientists to address the effects of drought and insect-pest pressure in a cost effective way for smallholder farmers in Africa.

Implementing WEMA

Developing drought-tolerant and insect-pest protected maize

- WEMA uses three breeding approaches: conventional; marker assisted; and genetic modification.
- The project focuses on developing, field testing and deploying new maize hybrids in Kenya, Mozambique, South Africa, Tanzania, and Uganda.
- The new maize hybrids will be assessed by national authorities according to their regulatory requirements.
- All WEMA maize hybrids will be made available to smallholder farmers through local seed companies across Sub-Saharan Africa.
- Seed companies will not pay royalties for WEMA hybrids in order to make them more affordable for farmers.
- WEMA uses breeding materials contributed by the International Maize and Wheat Improvement Center's Drought Tolerant Maize for Africa (DTMA) and Improved Maize for African Soils (IMAS) projects, Monsanto Company, and national agricultural research systems.
- Seed companies, government agencies, farmer groups and other relevant organisations will ensure access by farmers to WEMA hybrids.

Facts and figures on maize, drought and insect-pest protection

- Maize is the most widely grown staple crop in Africa – more than 300 million people depend on it as their main food source
- Three-quarters of the world's most severe droughts over the past decade have occurred in Africa
- In 2010, insect-pest protected maize was planted on 10.2 million hectares worldwide
- Insect-pest protected maize has been in the market for over 19 years. It is now grown in over 25 countries

WEMA Products

Drought TEGO®
Innovation and protection for a better harvest

TELA™
Stem-borer protected

TELA™
Stem-borer protected & drought tolerant

"I see the WEMA project leading the way in producing quality seeds. It's in our interest to get quality seed out to farmers and in large quantities."

Alois Kullaya, Plant Breeder and WEMA-Tanzania Country Coordinator

Progress

- Over 60 conventional drought-tolerant (climate-smart) hybrids trademarked DroughtTEGO™ have been developed and approved for commercialization.
- Since 2013, a total of 786 tonnes of seed have been availed to farmers for cultivation, conservatively reaching about 200,000 farm-households and benefitting 1.18 million people in the pilot countries.
- The project has received general or environmental approval of the transgenic (GMO) drought tolerant (DT) trait in South Africa and the insect-pest protected *Bt* trait in Kenya.
- Conventional drought-tolerant maize hybrids with insect-pest (*Bt*) protection will be marketed under the trademark TELA™.
- Transgenic (GMO) drought-tolerant maize with stacked-traits (DT-*Bt*) trials have commenced for their suitability and adaption; and when approved, they will be available to farmers from 2017 also under the trademark TELA™, but will be distinguished from the *Bt* hybrids by symbols.

Expected benefits of using drought-tolerant and insect-pest protected maize

- Protecting maize against climate change and insect damage is expected to increase yields by 20-35 percent in moderate drought conditions
- Will provide an additional two million tonnes of maize that could feed 14 – 21 million people in the long-term
- A more reliable harvest will give farmers the confidence to invest in their farms and improve farming practices
- More reliable harvests with better grain quality due to reduced insect damage
- Reduced need for pesticide because the seed is insect pest protected bringing environmental and human health benefits

20 - 35 percent...

increase in yield expected from use of drought-tolerant and insect-pest protected maize varieties under moderate drought

> ***By 2017 we expect that more than 500,000 farm families will be growing WEMA hybrids with an estimated value of yield increase worth over US$ 80 million***
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> *Sylvester Oikeh, WEMA Project Manager*

The Water Efficient Maize Project Partnership

- AATF is contributing its leadership, experience in public-private partnership management, technology stewardship and project management expertise.
- The national agricultural research systems in the five WEMA countries are contributing their adapted germplasm and expertise in breeding and field testing:
  - Kenya – Kenya Agricultural and Livestock Research Organisation (KALRO)
  - Mozambique – National Agriculture Institute of Mozambique (IIAM)
  - South Africa – Agricultural Research Council (ARC)
  - Tanzania – Commission for Science and Technology (COSTECH)
  - Uganda – National Agricultural Research Organisation (NARO)
- CIMMYT is providing high-yielding maize varieties and inbred lines that are adapted to African conditions and expertise in conventional breeding and testing for drought tolerance.
- Monsanto is contributing maize varieties from its global proprietary collection, drought-tolerant and insect protection genes, and its expertise in agriculture research and product deployment.
- Seed companies, government agencies, farmer groups and other relevant organisations will ensure access by farmers to WEMA varieties.

Investors

Project activities are funded by the Bill & Melinda Gates Foundation, Howard G. Buffet Foundation and the United States Agency for International Development (USAID.

> ***If we can get a maize seed that can do well even in drought-prone areas, it would really help. I am willing to spend money to buy that seed if I know that I will harvest something substantial at the end of the season. I will even increase the acreage under which I plant maize.***
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> *Obadia Mule, farmer, Machakos County, Kenya*

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